Creation of the technical conditions for the safe closure of shafts of the uranium ore deposit of Ronneburg in unconsolidated weak rocks

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Project objective: Development, testing and introduction conceptual solutions for filling up surface shafts, blind shafts and other day–openings in the Ronneburg uranium mining district

Location: Thuringia

Client: WISMUT GmbH

Beneficiary: WISMUT GmbH

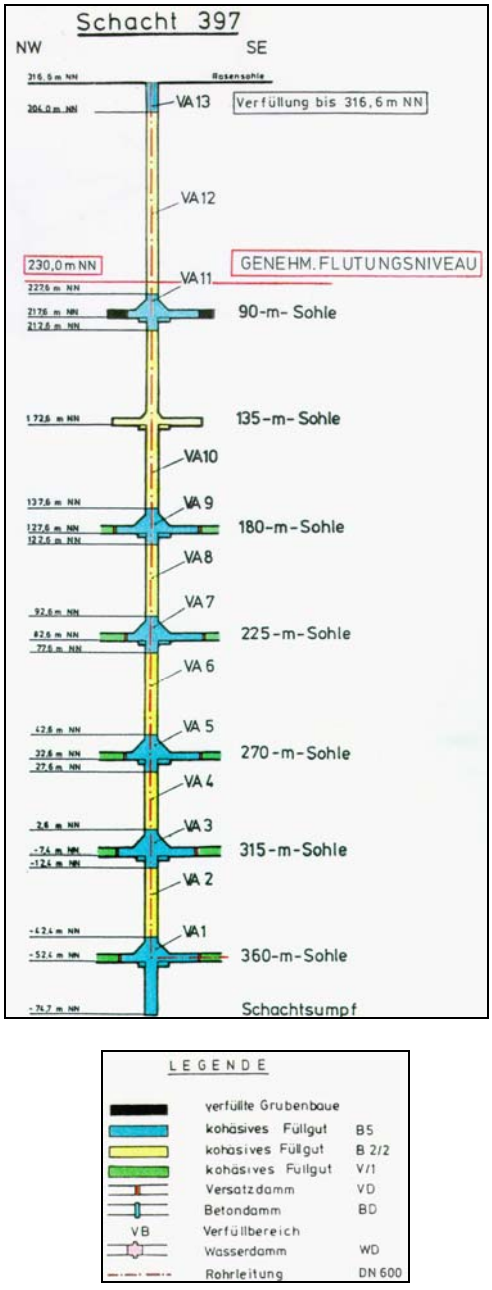
Time period: 1990 – 1995

Budget: 180,000 EURO

Initial situation:

Resulting from the unfavourable geological–geomechanic conditions in the Ronneburg uranium mining district the mines inspectorate demanded to fill up the shafts completely. Therefore it was necessary to find appropriate binding agents to make cohesive materials with concrete–like properties. In addition it had to be found practicable methods to bring in filling materials underground corresponding with the different conditions.

There was a high demand for inexpensive binding agents, which should have good strength properties and had to be applicable under the effect of aggressive flooding waters. Investigations and testing works were concentrated on fly ash from the combustion of lignite in power stations. Different kind of ashes were tested to find the best properties concerning the resistance against the attack of acid mine water.



Securing of a shaft by filling with cohesive materials
Client: WISMUT GmbH, SB Ronneburg

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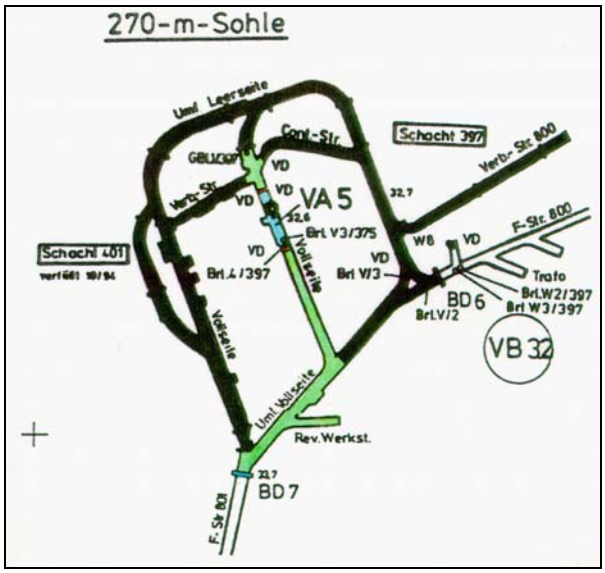
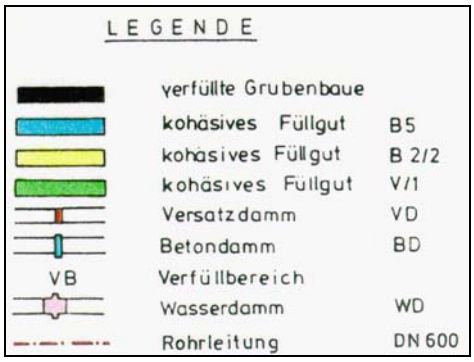
The developed solutions were tested with success in laboratory scale and in underground experimental works to make sure the approval by mines inspectorate. This was the basis for filling up 40 surface shafts successfully, what demanded high volumes of cohesive filling materials (more than 1,2 millions m³) .

Main tasks:

- Laboratory investigations to find out inexpensive binding agents in form of fly ashes to produce concrete–like filling materials for filling up the shafts
- Testing and introduction different kind of filling materials with various properties concerning strength and resistance against acid mine waters, which shall be used for filling up dry and water–filled shafts
- Testing different methods to bring in filling materials to underground without deteriorate quality
- Development of solutions preventing instability of the filling column in the draw points, which could be caused by mechanical and/or chemical effects
- Development of special solutions for extraordinary conditions on shafts, which should be filled up
- Supervision in carrying out the planned measures
- Expert assistance in preparing approval by mines inspectorate





Securing of a shaft landing during securing process
Client: WISMUT GmbH, SB Ronneburg